



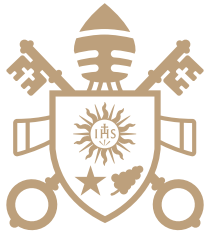
THE PONTIFICAL
ACADEMY
OF SCIENCES

WORKSHOP ON

SARS-COV-2 HEALTH POLICIES, VACCINATION AND LONG COVID: ACHIEVEMENTS AND CHALLENGES



19-20 November 2024
Casina Pio IV, Vatican City



"I offer you cordial greetings and I express my gratitude to the Pontifical Academy of Sciences for placing basic scientific research at the service of the health of our planet and its inhabitants....

In these days, my interest in your work is even keener, because you have a topic of profound concern for all humanity. You are focusing on the notion of science at the service of people for the survival of humanity in light of the SARS-CoV-2/COVID-19 pandemic and other global issues.

... It is significant, then, that ... the Academy brings together a number of different scientific disciplines; in this sense, it offers an example of how the challenges of the COVID-19 crisis should be addressed through coordinated efforts in the service of the entire human family."

Message of His Holiness Pope Francis on the Occasion of the Plenary Session of the Pontifical Academy of Sciences, 7-9 October 2020

Concept Note

The Pontifical Academy of Sciences (PAS) has been proactive in addressing the science and societal issues related to SARS-COV-2 through two conferences, along with related statements and publications. Pope Francis has emphasized the crucial role of science in tackling SARS-COV-2 and has called for greater attention to the equity aspects of the pandemic, including health and policy considerations. PAS remains committed to engaging with scientific, health policy, and ethical considerations to address the pandemic and its consequences.

Workshop Objectives

1. **Draw Lessons from Health and Science Policies:** Review the diverse health and science policies implemented during the pandemic.
2. **Review Vaccine Innovations:** Examine experiences from vaccine development, testing, implementation programs, side effects, and communication strategies.
3. **Share Insights on Long COVID:** Discuss the long-term health consequences of SARS-COV-2 infections, including causes and potential cures.

1. Lessons from Health and Science Policies

Before focusing on vaccines and Long COVID, the workshop will conduct a high-level review of lessons learned from health and science policies during the pandemic. The SARS-COV-2 pandemic has caused profound tragedy, with a staggering death toll and significant economic loss. As of December 3, 2022, there were 645 million confirmed cases and 6.6 million confirmed deaths. Social and economic recovery is ongoing. The workshop will share and review diverse experiences with health and science policies, including the impact of lockdowns on health, education, and child development, as well as international efforts like the COVAX (SARS-COV-2 Vaccines Global Access) initiative. Launched in April 2020, well before SARS-COV-2 vaccines were proven and available, COVAX aimed to accelerate vaccine development and ensure equitable access. Despite its innovation, upstream policy failures and downstream implementation constraints hindered widespread vaccine availability in low-income countries.

2. Vaccine Innovations and Implementation

The pandemic accelerated the deployment of scientific knowledge, leading to the rapid development of effective vaccines using various technol-

ogy platforms. By August 2022, 356 SARS-COV-2 vaccine candidates were developed, with 34 in large-scale use after conditional approval by national regulatory authorities or under the WHO Emergency Use Listing. These vaccines, developed using mRNA, viral-vectored, inactivated whole virus, protein subunit, and plasmid DNA technologies, each have unique attributes.

The long-term support of vaccine development research by governments illustrates the crucial role of public funding for high-priority public goods such as vaccine technology. However, many governments have not designed appropriate ways to manage co-funded **intellectual property**, which results in privatization of intellectual property supported by government funding. Companies exercise rights to the technologies under patent, and charge prices for mRNA vaccine doses much greater than the actual costs of manufacturing. Some governments in poorer countries were unable to pay such prices, and had to wait for donations or discounts. This raises ethical issues. Low-income countries were left with no effective access to highly priced vaccines other than through mechanisms such as the Global Alliance for Vaccines and Immunizations.

The workshop will explore next-generation vaccines with broader epitope coverage, longer protection, and fewer logistical challenges.

Vaccine Side Effects and Hesitancy: Vaccine side effects are a significant concern. Post-market surveillance data are crucial for assessing vaccine effectiveness to prevent SARS-COV-2 infections, severe diseases or deaths in the real world, as well as the incidence of adverse reactions. Breakthrough infections, waning immunity and the emergence of new variants highlight the need for ongoing evaluation. The effectiveness to prevent post-vaccination infections is much less satisfactory than the efficacy assessed in the original clinical trials. Factors such as booster schedules, costs, logistics, and local production capabilities influence vaccine procurement decisions. Vaccine hesitancy, driven by safety concerns, efficacy doubts, and mistrust, remains a global health threat. Understanding and addressing these concerns through targeted information can reduce severe illness and mortality.

Vaccine hesitancy, defined as the “delay in acceptance or refusal of vaccination despite the availability of vaccination services,” was identified by the WHO as one of the ten greatest global health threats. This

issue is not unique to SARS-COV-2 and has existed for other vaccines as well. SARS-COV-2 vaccine hesitancy primarily revolves around concerns about vaccine safety, efficacy, perceived risks, and mistrust of governments and health institutions. In some instances, side effects of certain vaccines became apparent after their release, exacerbating concerns and fueling misinformation. Understanding the characteristics and degrees of hesitancy among those influenced by misinformation on safety, efficacy, and risk is crucial. This knowledge can help identify priority groups for targeted information campaigns about the safety and efficacy of SARS-COV-2 vaccines, which are essential in reducing the risks of severe illness and mortality.

3. Long COVID: Causes and Cures

Long COVID, defined by WHO as “the persistence of symptoms or emergence of new symptoms 3 months from the onset of SARS-COV-2 that last for at least 2 months and cannot be explained by an alternative diagnosis” remains poorly understood. It affects quality of life, education and employment. Though it is widely accepted that long COVID is a real phenomenon, there are many questions about how to define the condition, what causes it and how to effectively treat it. It may actually be several diverse diseases. Accurate diagnosis is complicated by factors such as test methods, length of follow-up periods, accuracy of self-reporting, symptoms examined, reliance on parent-reported symptoms for children, negative PCR tests (false-negative results) in some patients, an absence of antibodies in patients who do not seroconvert, and difficulties in establishing a direct link between symptoms and the infection. Studies have reported various rates of long COVID with a wide range of symptoms. It is suggested that up to 35% of patients treated for SARS-COV-2 on an outpatient basis and up to 87% of patients hospitalized with SARS-COV-2 continue to experience symptoms.¹ Underlying chronic conditions such as diabetes, hypertension, and cardiovascular diseases may also worsen after SARS-COV-2 infection, necessitating closer monitoring.

Long COVID could be related to several factors, including organ damage, persistence of the virus in the body, post-viral syndrome, chronic inflammation, immune response, post-critical-care syndrome, complications from comorbidities, reactivation of the Epstein-Barr virus due to SARS-COV-2-related inflammation, and adverse effects of medications.

Risk factors for long COVID include older age, female sex, having more than five symptoms during the acute stage of infection, comorbidities, the presence of autoantibodies, and previous psychiatric disorders. Vaccination against SARS-COV-2 reduces the odds of developing long COVID, and individuals who had long COVID before vaccination often see improved symptoms post-vaccination.

Long COVID has substantial physical, mental, social, and economic impacts. Many affected individuals may have long-term healthcare and social care needs, requiring multidisciplinary and stigma-free care, which is not readily available in many settings. Continuous research and regular surveillance through international scientific collaboration are urgently needed. These efforts are essential for health and social care systems to develop effective long COVID treatment, rehabilitation, support algorithms, and policies related to disability, education, occupation, and finance.

Operational Information

- The conference will be held in-person, with an option for virtual participation.
- Speakers are asked to provide a brief paper of 5 to 10 pages, which will be edited and published in the PAS conference series (Scripta Varia) following the workshop.
- Presentations with PPT will be recorded and placed on the PAS YouTube channel, with the presenter’s consent.
- A Final Statement will be drafted, reviewed, and discussed by all participants before being finalized.

¹ 1 A.V. Raveendran,a,b,* Rajeev Jayadevan,c and S. Sashidharand. Long COVID: An overview. *Diabetes Metab Syndr*. 2021 May-June; 15(3): 869–875. doi: 10.1016/j.dsx.2021.04.007

DAY 1 | TUESDAY, 19 NOVEMBER, 2024

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| 09.00-09.20 | OPENING SESSION Chair: President Prof. Joachim von Braun - Word of welcome Cardinal Peter K.A. Turkson - Word of welcome |
| 09.20 | SESSION I: REVIEW OF LESSONS FROM HEALTH AND SCIENCE POLICIES DURING THE PANDEMIC Chair: Chien-Jen Chen <i>PAS Academician</i> |
| 09.20-09.50 | <i>Rapid COVID-19 vaccine development compromised by delayed deployment</i> Barney S. Graham <i>Director, David Satcher Global Health Equity Institute, Morehouse School of Medicine, Atlanta, USA</i> |
| 09.50-10.20 | <i>SARS-COV-2 science, vaccines and sharing – lessons for Mpox</i> Salim S. Abdool Karim <i>Director, Centre for the AIDS Programme of Research in South Africa (CAPRISA), South Africa</i> |
| 10.20-10.30 | <i>Keynote Address</i> Sania Nishtar <i>Gavi CEO, Geneva, Switzerland</i> |
| 10.30-11.00 | Coffee break |
| 11.00-11.30 | <i>Challenges of COVID-19 Pandemic Control Policy: Examples from the U.S.A.</i> Chunhuei Chi <i>Professor and Founder, Global Health Program, College of Health, Oregon State University, USA</i> |
| 11.30-12.00 | <i>Herbal medicine for the healthcare of COVID-19</i> Samuel Kleda <i>Archbishop of Douala, Cameroon</i> |
| 12.00-12.30 | Discussion |
| 12.30-14.00 | Lunch |
| 14.00 | SESSION II: INNOVATIVE PLATFORMS, VACCINE REAL-WORLD EFFECTIVENESS, ADVERSE REACTIONS, AND NEXT-GENERATION VACCINES Chair: Salim S. Abdool Karim |
| 14.00-14.30 | <i>Assessing real world effectiveness and safety of Covid-19 vaccines: analysis of routinely collected data</i> David A. Henry <i>Professor, Bond University, Queensland, Australia</i> |
| 14.30-15.00 | <i>Vaccination policy, coverage and real world data in Asia-Pacific Countries</i> Chien-Jen Chen <i>PAS Academician and Distinguished Professor, Genomics Research Center, Academia Sinica, Taiwan</i> |
| 15.00-15.20 | Coffee break |
| 15.20-15.50 | <i>Vaccination Policy And Coverage in India</i> Srinath Reddy <i>Founder (Past) President & Distinguished Professor of Public Health, Public Health Foundation of India</i> |
| 15.50-16.20 | <i>Low-sugar universal SARS-CoV-2 vaccines</i> Chi-Huey Wong <i>Scripps Family Chair Professor of Chemistry, Scripps Research Institute, USA</i> |
| 16.20-16.50 | <i>The Role of Contract Manufacturing in Response to Pandemics & Public Health Emergencies</i> Rahul Singhvi <i>CEO, National Resilience, Inc., USA</i> |
| 16.50-17.20 | Discussion |

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| 17:20 | SESSION III: VACCINATION POLICIES, HEALTH INEQUALITY, AND VACCINE HESITANCY Chair: Srinath Reddy Kolli |
| 17.20-17.50 | <i>Reflection on successes and failures of the response to the pandemic in Israel</i> Michael Edelstein Professor, Azrieli Faculty of Medicine, Bar Ilan University, Israel |
| 17.50-18.20 | <i>Acceptance of COVID-19 Vaccine: A Global Review, 2020-2023</i> Jeffery V. Lazarus Professor, CUNY Graduate School of Public Health and Health Policy, CUNY, USA |
| 18.20-18.50 | <i>Misinformation, social media and vaccine hesitancy</i> Melinda C. Mills Director and Professor, Demography and Population Health, University of Oxford, UK |
| 18.50-19:20 | Discussion |
| 19:20 | Dinner at Casina Pio IV |

DAY 2 | WEDNESDAY 20 NOVEMBER, 2024

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| 09.00 | SESSION IV: LONG COVID – EMERGING SCIENCE INSIGHTS, RISK FACTORS, CLINICAL MANAGEMENT AND SOCIAL CARE Chair: Jeffery V. Lazarus |
| 09.00-09.30 | <i>Acceptance of enforcing public health mandates: Reflections and evaluation of post-COVID-19 fatigue</i> Ayman El-Mohandes Dean, CUNY Graduate School of Public Health and Health Policy, USA |
| 09.30-10.00 | <i>Clinical research and management and social care of long COVID</i> Carmen Scheibenbogen Chair, Section of Immunodeficiency and Postinfectious Diseases, Institute of Medical Immunology, Charité, Berlin, Germany |
| 10.00-10.20 | Coffee break |
| 10.20-10.50 | <i>Lessons from Covid-19 for future pandemic preparedness</i> Quarraisha Abdool Karim Associate Director, Centre for the AIDS Programme of Research in South Africa (CAPRISA), South Africa |
| 10.50-11.20 | <i>Forecasting Future Human Capital: Education, Skills, and the Long Shadow of COVID-19</i> Anne Goujon Director, Population and Just Societies Program, International Institute for Applied Systems Analysis (IIASA), Austria |
| 11.20-12.10 | Discussion |
| 12.10-14.00 | Lunch |
| 14.00 | CONCLUDING SESSION CoChairs: Joachim von Braun <small>PAS President</small> and Chien-Jen Chen <small>PAS Academician</small> |
| 14.00-14.30 | <i>Perspective from Holy See on Decreasing inequalities in SARS-COV-2 science and health policies</i> H.E. Archbishop Paul Richard Gallagher Secretary for Relations with States and International Organizations, Secretariat of State, Holy See |
| 14.30-15.00 | Conference Conclusions A structured discussion with prepared questions Agreement on recommendations and a draft statement |
| 15.00 | End of the Conference |
| 18.00 | Dinner hosted by Prof. Chen Chien-Jen, PAS Academician, at the residence of H.E. Matthew Lee, Ambassador of the Republic of China |

List of Participants

Joachim von Braun

PAS President
The Pontifical Academy of Sciences,
Bonn University, Germany

Cardinal Peter K.A. Turkson

Chancellor
The Pontifical Academy of Sciences
The Vatican City

H.E. Archbishop Paul Richard Gallagher

Secretary for Relations with States and International
Organizations, Secretariat of State, Holy See

Chien-Jen Chen ■ PAS Academician

Distinguished Professor, Academia Sinica, Taiwan

Chunhuei Chi

Professor and Founder, Global Health Program, College
of Health, Oregon State University, USA

Michael Edelstein

Professor, Azrieli Faculty of Medicine, Bar Ilan University, Israel

Ayman El-Mohandes

Dean, CUNY Graduate School of Public Health and Health Policy, USA

Anne Goujon

Director, Population and Just Societies Program, International
Institute for Applied Systems Analysis (IIASA), Austria

Barney S. Graham

Director, David Satcher Global Health Equity Institute,
Morehouse School of Medicine, Atlanta, USA

David A. Henry

Bond University, Australia

Salim S. Abdool Karim

Director, CAPRISA, South Africa

Quarraisha Abdool Karim

Associate Director, CAPRISA, South Africa

Samuel Kleda

Archbishop of Douala, Cameroon

Jeffery V. Lazarus

Professor, CUNY Graduate School of Public
Health and Health Policy, CUNY, USA

Melinda C. Mills

Director and Professor, Demography and Population
Health, University of Oxford, UK

Sania Nishtar

Gavi CEO, Geneva, Switzerland

Srinath Reddy

Founder (Past) President & Distinguished Professor
of Public Health, Public Health Foundation of India

Carmen Scheibenbogen

Chair, Section of Immunodeficiency and Postinfectious Diseases,
Institute of Medical Immunology, Charité, Berlin, Germany

Rahul Singhvi

CEO, National Resilience, Inc., USA

Msgr Dario E. Viganò

Vice Chancellor
The Pontifical Academy of Sciences
The Vatican City

Chi-Huey Wong

Scripps Family Chair Professor of Chemistry,
Scripps Research Institute, USA

Accompanying Persons

Fong-Ping Lo Chen

Spouse of Chien-Jen Chen, Taipei, Taiwan

Ching-Yue Chi

Spouse of Chunhuei Chi, Portland, USA

Cynthia Turner-Graham

Spouse of Barney Graham, Atlanta, USA

Julia Lowe

Spouse of David A. Henry, Queensland, Australia

Yieng-Lii Wong

Spouse of Chi-Huey Wong, San Diego, USA

Andrew Wong

Son of Chi-Huey Wong and Yieng-Lii Wong, San Diego, USA

General information

- Dress code is business attire.
- Accompanying persons are invited to the entire event on 19 and 20th including the meals.
- Please remember to bring a valid ID.
- In case of any problems, please call the Academy on +39 0669883195 or +39 0669881441.
- On travel days, the mobile phone number +393420026216 will be available.
- Please refer to www.pas.va for further information on the Academy, the Academicians, and current and past events.

Access instructions to the Vatican and the Casina Pio IV

- Your name is already communicated to the Vatican Security. The Security at the gate will check your Identity and let you in. If you are willing to bring someone in, kindly let us know, and we shall add their name on the list.
- You can come through the closest entrance called Perugino (Via della Stazione Vaticana, no number, it's a very short street). Instructions to the Casina Pio IV, headquarters of the Pontifical Academy of Sciences, can be found in the following link: <http://www.casinapioiv.va/content/accademia/en/about/contacts.html>
- For all eventualities the telephone numbers of the Academy are the following:
06 69883195 or 06 69883451. A Mobile number is also available +39 3420026216



IMPORTANT

**Please check your PPT presentation
with the conference technicians before your talk.**



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Password: will be available in the Casina Pio IV

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